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Marine Casualty Investigations

Enquêtes sur les accidents maritimes

Investigation Report to the Minister pursuant to sections 542 or 545 of the Canada Shipping Act

Rapport d'investigation au Ministre conformément aux articles 542 ou 545 de la Loi sur la marine marchande du Canada

Canada

This report is a translation of the original which was in French

Ce rapport est aussi disponible en français.

REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE COLLISION ON THE ST. LAWRENCE RIVER BETWEEN THE VESSEL "ALGOWEST" AND "COUDRES DE L'ÎLE" BELOW THE LES ESCOUMINS PILOTAGE STATION ON JUNE 15, 1988.

REPORT No. 518

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REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE COLLISION ON THE ST LAWRENCE RIVER BETWEEN THE VESSELS "ALGOWEST" AND "COUDRES DE L'ÎLE" BELOW THE LES ESCOUMINS PILOTAGE STATION ON JUNE 15, 1988

Particulars of the vessels

Name	"ALGOWEST"	"COUDRES DE L'ÎLE"
Official No	372057	301284
Port of Registry	Sault Ste Marie	Québec
Flag	Canadian	Canadian
Call Sign	VCBZ	VA6899
Gross tonnage	20,310 tons	561 tons
Net tonnage	14,591 tons	266 tons
Registered length	219.21 m	57.85 m
Overall Length	222.51 m	60.97 m
Breadth	23.16 m	9.02 m
Moulded Depth	12.81 m	4.17 m
Draught (at time of collision)	Forward - 7.80 m Aft - 7.90 m	3.30 m 3.91 m
Type	Great Lakes bulk carrier	Coaster
Built	Steel, built at Collingwood in 1982	Steel, built in Holland in 1954
Propulsion	Diesel engine, 9464 BHP with variable pitch propeller	Diesel engine, 650 BHP, driving a single fixed pitch propeller
Bow thruster	One	None
Cargo	Wheat 27,679 tonnes	Mainly old crushed cars 450 tonnes
Crew	24 persons and 5 guests	10 persons

Classification	American Bureau of Shipping	Canada Marine
Owners	Algoma Central Railway, Sault Ste Marie	Navigation Ile-aux-Coudres Inc Iles-aux-Coudres

Navigating equipment

Name	"ALGOWEST"	"COUDRES DE L'ÎLE"
Radar	Decca RM 1629B	SI-TEX T-23
Radar	Decca RM 929L	K & H T-17
Echo sounder	Simrad Ed 162	K & H
Loran C	SI-TEX 770	One
VHF 1	SRA	One
VHF 2	SAILOR C-403	One
SSB	None	One
Gyro compass 1	SPERRY MR-37	SPERRY
Gyro compass 2	SPERRY MR-37	-
Magnetic compass	One	One
Automatic pilot	SPERRY	None
Course recorder	TOKYO KEIKI	None

NOTE: All times in this report are expressed in Eastern Daylight Saving Time (UTC minus four hours) unless otherwise specified.

Brief description of the vessels

(i) The "COUDRES DE L'ÎLE" was a small cargo vessel with accommodation, engine room and navigation bridge aft.

Forward of the accommodation, there were a single 36.80-metre long hold and two hatches. Forward of the hold, there were the collision bulkhead and the fore peak. Her registered length was 57.85 metres, her gross tonnage was 561 tons and her breadth 9.02 metres.

Her propulsion system consisted of a Werkspoor diesel engine, 650 BHP, driving a single fixed pitch propeller. According to records, her speed was 10.5 knots.

(ii) The vessel "ALGOWEST" is a Great Lakes carrier, 222.51 metres length overall, 23.16 metres in breadth and gross tonnage of 20,310 tons.

The accommodation, engine room and navigation bridge are aft. Forward of the accommodation, there are 4 holds and 18 hatches.

The vessel has a bulbous bow and her propulsion system consists of a diesel engine of 9,464 BHP, driving a variable pitch propeller. According to records, her speed is 15 knots.

Background

On June 15, 1988, at about 0605 in the morning, a collision took place in a thick fog east of the Les Escoumins pilotage station between the downbound vessel "ALGOWEST" and the upbound vessel "COUDRES DE L'ÎLE". The latter listed to port following the impact of the collision and then sank quickly. One crew member disappeared and the other nine were rescued.

This collision took place in the Les Escoumins radar monitoring area some 11 to 12 nautical miles northeast of the station. Before and after the collision, the radar target of the "COUDRES DE L'ÎLE" appears not to have been detected on the Les Escoumins VTS Centre's radar screen.

At the time of the collision, the "ALGOWEST" was damaged and the preliminary estimates of the cost of repairs were about $100,000, while the loss of the "COUDRES DE L'ÎLE" was estimated at about $500,000.

Victim

Name	Françoise Villeneuve
Position on board the vessel	Cook
Age	28 years
Address	Sillery, Quebec

At the time of writing of this report, the cook of the "COUDRES DE L'ÎLE" was still missing and presumed drowned.

Narrative

The "ALGOWEST"

The downbound vessel "ALGOWEST", proceeding from Thunder Bay with a full cargo of wheat, arrived at the Les Escoumins pilotage station on June 15 at about 0446. The fog had been thick since 0112. After the departure of the "ALGOWEST" from the pilotage station, the course was set on 045° (G). The "ALGOWEST" reported her departure from the pilotage station to the Les Escoumins VTS at about 0500. At the same time, she informed the regulator of her intention to pass north of the traffic lane for upbound vessels. During this radio communication which the Les Escoumins VTS, the "ALGOWEST" asked the regulator what vessels were upbound. The regulator replied that there were two vessels upbound for the pilotage station and that the closest vessel was the "ALGOBAY" and that the other, the "CAST POLAR BEAR", was 10.8 miles east of Les Escoumins. During this conversation between the Les Escoumins VTS and the "ALGOWEST", the regulator on duty at the sector A1 console which covers the sector between Manicouagan and Île Blanche, omitted to inform the "ALGOWEST" that there were three other upbound vessels below Pointe au Boisvert, namely the "COUDRES DE L'ÎLE", "CANADIAN LEADER" and "NORCHEM".

The course of 045° (G) headed the "ALGOWEST" within the Les Escoumins ship routing system recommended for upbound vessels and to leave that lane midway between Pointe au Boisvert and Les Escoumins. At about 0540/0545, the officer of the watch detected on the radar screen a target 30° to port and about 7 miles distant. This radar target was faint and he deduced that it was a fishing vessel. The bearing of this target was constant and, once again, the officer of the watch deduced that this fishing vessel was stopped. Apart from that target, there was no other target on the radar screen.

When 5 miles distant, the officer of the watch noticed that the bearing of this radar target was closing ahead. At an estimated distance of 2.5 to 3 miles and on a bearing which was constantly closing, the officer of the watch notified the Master that a close-quarters situation was developing. At about 0600, the Master ordered the helmsman to alter course from 045° to 050° (G). This alteration in course was then followed by another alteration in course to starboard, this time to a heading of 056° (G) at about 0603. During this time the engine was on full speed ahead and the fog signal sounded automatically every two minutes. Despite these two alterations in course to starboard, the radar target was constantly closing from ahead and suddenly, it disappeared in the false radar echo from the forepart of the "ALGOWEST". At that moment, the Master went to the port window which was open and, on the way, he noticed the "COUDRES DE L'ÎLE" fine on the port bow and a few seconds later, the impact occurred. According to the vessel, it was 0605. At the time of impact, the propeller pitch was gradually reduced to zero, then put on 'astern'. The "ALGOWEST" turned to port in order to return to the scene of the collision while the general alarm was sounded.

Moments after the collision, the "COUDRES DE L'ÎLE", listing slightly to port, disappeared in the thick fog. On the bridge, an attempt was made to locate the radar target of the "COUDRES DE L'ÎLE" and, in fact, a faint target was seen 2 cables to port. This faint target disappeared suddenly from the radar screen of the "ALGOWEST". When the latter disappeared about 2 cables away, the radar screen displayed many faint targets which, later, dissipated completely from the radar screen. The "ALGOWEST" conducted a search and at about 0715, a liferaft with 9 persons on board was spotted. The liferaft approached the port side of the "ALGOWEST" and the 9 survivors were taken on board and it was then learned that one crew member was missing. At 0915, the survivors were transferred to the CCGS "SIMON FRASER". The "ALGOWEST" resumed course to Baie-Comeau at about 1150 and arrived at her destination the same day at about 1830. At Baie-Comeau, the profile of the starboard bow of the "COUDRES DE L'ÎLE" was observed imprinted on the port bow of the "ALGOWEST".

The "COUDRES DE L'ÎLE"

The "COUDRES DE L'ÎLE" left Sept-Iles on June 14 at 1430 with a cargo of old crushed cars and a small quantity of other cargo bound for Montreal. A deck cargo of old crushed cars was stowed to a height of about 3 metres.

The "COUDRES DE L'ÎLE" entered the fog at 0130 and at 0400, there was a change in watch on the bridge. At about 0520, the "COUDRES DE L'ÎLE" reported to the Les Escoumins VTS at Pointe au Boisvert. At the same time, the regulator informed her that there was a vessel downbound for Pointe au Boisvert, but did not give her name or her course. This vessel was the "ALGOWEST". At Pointe au Boisvert, the "COUDRES DE L'ÎLE" altered course to 220° (G) and the engine was on full speed ahead. The "COUDRES DE L'ÎLE" was proceeding north of the area of the recommended routes for upbound vessels. Afterward, the officer of the watch detected a radar target 12 miles right ahead. Thinking that this downbound vessel was a Great Lakes vessel bound for Baie-Comeau and, knowing that these vessels use the north side to go to Baie-Comeau, he ordered the helmsman, when the target was 5 miles distant, to alter course to port and to steer 210° (G), that is, a 10° alteration in course to port. After this alteration in course, the officer of the watch observed the radar target on his starboard side. When about 3 miles distant, he realized that something was wrong. The radar target seemed to be headed straight for him. He ordered the helmsman to put the rudder hard to port and the heading on 195° (G) when the target was 1.5 miles distant. Despite this alteration in heading, the officer of the watch noticed that the echo seemed to be coming closer and closer and, suddenly, on the radar screen, there was a side lobe effect. Then he noticed the port side of the "ALGOWEST" which was heading to cross ahead of the "COUDRES DE L'ÎLE". A few

seconds later, she collided with the "ALGOWEST". On seeing the "ALGOWEST", the helmsman grabbed the telegraph and ordered full astern.

After the impact, the "COUDRES DE L'ÎLE", listing to port, began to sink by the head. The master awakened by the impact, hurried to the bridge and ordered the helmsman to assemble the crew and the officer of the watch to prepare the lifeboat. At the same time, he called the Les Escoumins VTS and without waiting for a reply, he left the wheelhouse. Since the vessel was listing more and more to port and the bow was sinking quickly, it was decided to launch the liferaft. At that moment, the vessel was listed some 80° to port, bow down, and with the stern clear of the water. All the crew members jumped overboard and then headed for the liferaft that was floating not far from the vessel. During this time, the cook was still on board the vessel and she shouted for help while the crew members told her to jump into the water, but she did not jump. One crew member saw her gripping the bulwark and she disappeared with the vessel about 90 seconds after the collision.

Analysis of the main factors

1. Certificates of the vessels involved in the collision

At the time of the collision, all the certificates of the "ALGOWEST" and "COUDRES DE L'ÎLE" were valid.

(a) The "COUDRES DE L'ÎLE" had the following certificates:

- International Load Line Certificate (1966) L.L.2, issued under the provisions of the International Convention on Load Lines, 1966, expiring on March 31, 1991. The last periodic inspection date was April 5, 1988.

- SIC 17 Inspection Certificate, Coastal Trade Steamship, Class II. This certificate had been issued to the vessel on April 5, 1988, expiring on June 4, 1988. On May 25, 1988, this certificate was extended to August 4, 1988 while awaiting a stability booklet approved by the Canadian Coast Guard authorities.

- Radio Inspection Certificate for the Great Lakes #Q2-06, expiring December 31, 1988.

- Radio Inspection Certificate for the Coasts of Canada, #Q2-05, expiring April 4, 1989.

(b) The "ALGOWEST" had the following certificates:

- Load Line Certificate for the Great Lakes and Inland

Waters of Canada, L.L.3A, issued under the provisions of the Canada Shipping Act by the American Bureau of Shipping on October 8, 1987 and valid until July 31, 1992. The last periodic inspection date was March 19, 1988.

- SIC 19 Inspection Certificate, Inland Waters Steamship, Class I. This certificate had been issued on March 20, 1988 and expiring on March 19, 1989.

- Radio Inspection Certificate for the Great Lakes, expiring January 31, 1989.

- Radio Inspection Certificate for the Coasts of Canada, expiring March 17, 1989.

2. Lifesaving equipment

At the time of the last inspection on April 5, 1988 by a Canadian Coast Guard inspector, the "COUDRES DE L'ÎLE" had on board the following lifesaving equipment:

- two (2) lifeboats with a total capacity of 30 persons;

- one (1) RFD MK6 #8133 inflatable liferaft, capacity 10 persons;

- four (4) lifebuoys;

- two (2) lifebuoys with life lines;

- two (2) lighted lifebuoys;

- ten (10) lifejackets;

- ten (10) survival suits.

The last inspection of the inflatable liferaft had taken place in August 1987 for a one-year period.

The starboard lifeboat was made of aluminum and the other, the port lifeboat, was made of wood.

This lifesaving equipment on board the "COUDRES DE L'ÎLE" was in compliance with the Lifesaving Equipment Regulations for Class X vessels.

3. Navigational aids and onboard instruments

On board the two vessels involved in the collision, all the navigational aids, onboard instruments and VHF radiotelephones were in good working order.

The "ALGOWEST" was equipped with a course recorder. At the time of the collision it was on, the quadrant was correctly set but the heading indicated +40°.

Contrary to what the officer of the watch of the "COUDRES DE L'ÎLE" stated, the radar in use at the time of the collision was fitted with an on/off anti-rain clutter switch, and this switch could attenuate the effect of precipitation on the radar screen.

4. Propulsion equipment

The propulsion equipment and any other onboard machinery of the two vessels were in good working order and did not contribute to the collision.

5. Weather conditions

At the time of the collision, the weather was overcast, the sea was calm and visibility almost nil because of thick fog. The wind direction varied at about 1 knot and the air and water temperature was 8.0°C.

6. State of the Tide

On June 15, 1988, according to the Canadian Tide and Current Tables, low tide at Les Escoumins was predicted to be at 0910 and the collision occurred approximately 4 hours after high tide at Les Escoumins.

At the time of the collision, the tide was ebbing and, in Sailing Directions, Gulf and River St Lawrence, Sixth Edition, 1985, the tidal stream is described as follows:

"The ebb tidal stream along the north side of the river is deflected southward by Pointe de Mille-Vaches, Pointe Betsiamites, and Pointe de Manicouagan, and by the ebbing streams of the large rivers between them; mariners should allow for this southerly set."

7. Brief history of the COUDRES DE L'ÎLE"

The "COUDRES DE L'ILE" was built in 1954 at the Waterhuizen shipyard in Holland and registered under the name "HAAKSHEIGEN". Later, she was transferred to Liverpool, England, shipowners in 1971 and registered under the name "FERNFIELD" and in 1972, during a short period in the Republic of Ireland under the name of "SHEVRELL". In May 1972, she was transferred to Canadian shipowners and registered under the name of "COUDRES DE L'ÎLE".

8. Sister ship of the "COUDRES DE L'ÎLE", the "EIBERGEN"

The sister ship of the "COUDRES DE L'ÎLE" had also been built in 1954, in Holland, at the same shipyard, and registered under the name of "EIBERGEN". She was later transferred to shipowners in Liverpool, England in 1960 and registered under the name of "FORDFIELD". On January 11, 1962, the "FORDFIELD", after capsizing in a heavy storm, sank 10 miles southeast of Owers Light-Vessel in the English Channel.

9. The cargo

At the time of the collision, the "COUDRES DE L'ÎLE" was carrying 400 tonnes of old crushed cars, approximately 160 tonnes of which were stowed on deck; 30 tonnes of railway ties; 58 barrels of used oil (18 tonnes) and about one tonne of miscellaneous cargo. All the tanks and the fore peak were full of liquid ballast and about 6,000 gallons of diesel fuel.

10. Securing of the deck cargo

The deck cargo of old crushed cars, stowed to a height of about 3 metres, was secured with chain lashings fastened with hook-up turnbuckles. The chain was secured on each side of the deck along the bulwark to eyebolts and fastened on the top of the deck cargo with turnbuckles, the tensioning levers of which had not been moused but simply had the ends of the lengths of chain turned round them. After the collision, just before sinking and while listing sharply, the "COUDRES DE L'ÎLE" reportedly lost the deck cargo.

11. Speed of the "COUDRES DE L'ÎLE" and the "ALGOWEST"

(i) The "COUDRES DE L'ÎLE" covered a distance of 47 nautical miles between Pointe de Manicouagan and Pointe au Boisvert at an average speed over the ground of 9.75 knots.

(ii) The logbook of the "ALGOWEST" indicated that the pilot had disembarked at 0500 and the engine room log showed that at 0502 the engine RPMs were 500. These RPM are equivalent to a shaft RPM of 120 which, in the vessel's loaded condition, approximates to a speed of 12.5 knots.

The"ALGOWEST" had apparently covered a distance of about 11 nautical miles from Anse-aux-Basques to the position of the collision. Given the reduction in speed to disembark the pilot and the increase to full speed ahead afterward, it is reasonable to believe that at the time of the collision the average speed over the ground of the"ALGOWEST" was somewhat in excess of 11 knots.

12. Angle of impact

The bow of the "COUDRES DE L'ÎLE" struck the bow of the "ALGOWEST" on the port side. On impact, the "COUDRES DE L'ÎLE" was on a heading of about 195° (G) whereas the "ALGOWEST" was on a heading of about 056° (G) according to her course recorder. The angle of impact of the "COUDRES DE L'ÎLE" against the port bow of the "ALGOWEST" was about 40°. The gyro compass error of the "COUDRES DE L'ÎLE" and the "ALGOWEST" was +2° and nil respectively.

13. Position of the collision

With regard to the "COUDRES DE L'ÎLE", the position of the collision remains unknown. With regard to the "ALGOWEST", there is on the nautical chart in use at the time of the collision a position which indicates the scene of the collision. However, the time of the collision was reportedly given as 0605 in a position that apparently had been taken by someone, who was not identified, before or after the collision. If such is the case, the time of the collision would be correct but the position of the collision doubtful.

As soon as the "ALGOWEST" reported to the Les Escoumins VTS Centre that she had collided with the "COUDRES DE L'ÎLE", a radar bearing and distance of the target which was the "ALGOWEST", gave that this target was located at 053° (T) and at a distance of 11.7 miles from the Les Escoumins radar antenna. At about 0730, the "ALGOWEST" reported to the Les Escoumins VTS Centre that she was in the debris and that her position was 184° (G) from Pointe au Boisvert at a distance of 8.4 miles.

The bearing and the distance from the radar station as soon as the "ALGOWEST" reported that she had collided with the "COUDRES DE L'ÎLE" showed that the "ALGOWEST" was near the northern limit of the traffic lane reserved for upbound vessels. The second position, i.e. that at 0730, indicated the position of the debris.

However, according to a review of the events and manoeuvres, to avoid the collision, on the part of both vessels, the collision would have taken place about two or three cables east of the position where the wreck of the "COUDRES DE L'ÎLE" appears to be resting.

14. Location of the wreck of the "COUDRES DE L'ÎLE"

At the request of the Marine Casualty Investigations Division of Transport Canada, the Canadian Hydrographic Service located a single wreck in the area searched on October 9, 1988.

The wreck, which appears to be that of the "COUDRES DE L'ÎLE", was located with the help of a side scanning echo

sounding system. The equipment had been placed on board the Canadian Coast Guard ship "EARL GREY" to search the area where the collision had taken place.

The wreck was located in 48°25'56"N, 069°12'04"W at a depth of nearly 300 metres. The image on the graph paper (See Annex VI) shows debris which appears to be the deck cargo that the "COUDRES DE L'ÎLE" was carrying, scattered around the wreck. The wreck is resting on a flat bottom upright on her keel in an east-west direction. If the wreck is that of the "COUDRES DE L'ÎLE", the bow appears to have been heavily damaged because of the length of the intact part which appears to be about 55 metres from stem to stern. The "COUDRES DE L'ÎLE" had an overall length before the collision of 60.97 metres. This leads to the belief that approximately 5 metres of the bow of the "COUDRES DE L'ÎLE" was destroyed because of the impact of the collision and the impact with the bottom.

15. The "COUDRES DE L'ÎLE" from Pointe au Boisvert up to the position of the collision

The "COUDRES DE L'ÎLE" was approximately 3 miles from Pointe au Boisvert when the officer of the watch took a bearing for the last time and then set a course of 220° (T) tangent to the circle of the pilot embarkation area at Les Escoumins. At that time, on the radar screen of the "COUDRES DE L'ÎLE", there was only one target, namely that of the Canadian upbound vessel "CANADIAN LEADER". This radar target was located about 45° on the port quarter of the "COUDRES DE L'ÎLE" and about 5 miles distant.

Since the Les Escoumins VTS had informed the "COUDRES DE L'ÎLE" that there was a vessel downbound for Pointe au Boisvert, the officer of the watch changed the scale of his radar from 12 to 24 miles in order to detect the target of the downbound vessel. On this 24-mile scale, the officer of the watch seemed to see a faint target through the attenuation of signal caused by the fog, right ahead and some 12 miles distant.

According to the officer of the watch, the radar equipment was not fitted with an anti-rain clutter switch and therefore could not reduce the effect of the fog on his screen. He went back to the 12-mile scale and since he could not see the target of the downbound vessel, he went back to the 24-mile scale. Some time later, he once again changed the 24-mile scale to 12 miles and this time, he clearly saw a target right ahead and 7 miles distant. This radar target, i.e. that of the "ALGOWEST", remained right ahead until 5 miles distant. At that moment, the officer of the watch ordered the helmsman to steer 210° (G), i.e. a 10° alteration of course to port.

The decision of the officer of the watch to alter to port 10 degrees was motivated by three factors:

- the radar target observed was that of a downbound vessel probably bound for Baie-Comeau;

- vessels bound for Baie-Comeau usually proceed north of the area of the recommended route for downbound vessels;

- the course of 220° (T) of the "COUDRES DE L'ÎLE" was converging inside the area for upbound vessels.

In the circumstances, the officer of the watch concluded that it was preferable for the "COUDRES DE L'ÎLE" to come to port in order to leave more sea room for the downbound vessel.

After this 10° alteration in course to port, the officer of the watch noticed a change in the relative path of this target which began to open to starboard. After an estimated distance of 2 to 3 miles, the relative path of this target began to close ahead of the "COUDRES DE L'ÎLE". The officer of the watch noticed that something was wrong. He therefore ordered the helmsman to come once again to port and then he ordered "steady" and the helmsman answered him 195° (G). During this time, the officer of the watch changed the scale from 6 to 3 miles. On the 3-mile range, the distance of the target was estimated at 1.5 miles and approaching constantly; then it disappeared in the side lobe effect. A few seconds later, the downbound vessel "ALGOWEST" was seen through the fog at a distance that was estimated to be from 4 to 5 metres from the bow and without any time to react, there was a collision with the "ALGOWEST". The stem of the "COUDRES DE L'ÎLE" struck the port bow of the "ALGOWEST" heavily.

Before the impact, the officer of the watch wanted to use the fog whistle to give a signal but it did not work. The fog whistle of the "COUDRES DE L'ÎLE" worked on manual control and compressed air.

In summary, it was stated with certainty that when the "COUDRES DE L'ÎLE" was proceeding on a course of 220° gyro the target of the "ALGOWEST" was detected faintly when 12 miles distant. The scale of her radar was 24 miles at that time. When the scale was brought back to 12 miles, the target of the "ALGOWEST" was still right ahead and 7 miles distant. This target remained right ahead until 5 miles distant and it was then that the course of the "COUDRES DE L'ÎLE" was altered 10° to port in order to give more sea room to the downbound vessel. Following this alteration in heading, the relative path of the target of the "ALGOWEST" began to open to starboard up to a distance estimated between 2 and 3 miles. It was after this distance

that a change was noted in the relative path of the target of the "ALGOWEST" which began to close ahead of the "COUDRES DE L'ÎLE". Since the target of the "ALGOWEST" was coming dangerously close to the "COUDRES DE L'ÎLE", the course was again altered, this time 15° to port and up to a heading of 195° (G). Afterward, the "COUDRES DE L'ÎLE" maintained this heading until the collision with the "ALGOWEST".

16. "COUDRES DE L'ÎLE" - Abandoning ship and rescue

As soon as the "ALGOWEST" was visible a short distance from the "COUDRES DE L'ÎLE", the telegraph was rung to full astern. Wanting to carry out the wheelhouse order, the engineer of the watch felt the impact of the collision at the same moment. He therefore stopped the engine and evacuated the engine room because the vessel was listing to port.

Meanwhile, the crew members had all been awakened by the impact of the collision. The master hurried immediately to the wheelhouse while the helmsman of the watch inspected all the cabins to make sure that all the crew members were awake.

On arriving in the wheelhouse, the master quickly determined that his vessel was going to sink. The bow of the "COUDRES DE L'ÎLE" was sinking and she was listing progressively to port. He therefore ordered the officer of the watch to launch a lifeboat and at the same time, he made a VHF radio call on channel 9 to the Les Escoumins VTS rather than a distress call. Unfortunately, this call from the "COUDRES DE L'ÎLE" took place at the same time as the call from the "ALGOWEST" to the "COUDRES DE L'ÎLE". These two calls were made simultaneously and were recorded at the Les Escoumins VTS at about 0603.

After this call, the master evacuated the wheelhouse and went to get his survival suit from his cabin. Meanwhile, the officer of the watch tried to launch the starboard lifeboat but without success because the vessel was listing to port. Since the vessel was listing dangerously and the bow was sinking quickly the crew members launched the liferaft.

The master left his cabin without a lifejacket but took his survival suit with him in a bag. He went out onto the starboard deck with a great deal of difficulty because of the list. He then climbed over the bulwark and walked down the ship's side to the bilge keel.

All the crew members of the "COUDRES DE L'ÎLE" gave a similar version of the facts concerning the abandoning of the vessel which can be summarized as follows:

The master, barefooted, was on the starboard side near the bilge keel when, after the vessel jolted, he slipped and fell into the water. The chief officer was at one point caught in the accommodation and when he managed to open a door, he found himself on the surface and not far from the raft. Another crew member managed to jump onto a parcel of lumber that was floating not far from the vessel. The others had to jump into the water and most of them were dragged down by the eddy of the sinking vessel and then resurfaced out of breath.

As for the victim, no one seems to have seen her again after she left her cabin with a lifejacket which, according to some, was not tied and with her bag which contained her survival suit. However, several heard her shouting desperately but they could not say exactly where she was, except one. This witness stated that he had seen her gripping the starboard bulwark while the vessel was sinking quickly and she then disappeared from the surface with the vessel.

Another seaman, before jumping, noticed that the painter of the liferaft was still secured to the vessel. He managed to undo it partly and then he jumped into the water and was dragged into the eddy of the sinking vessel. He also resurfaced out of breath. While the "COUDRES DE L'ÎLE" was disappearing from the surface, she dragged with her the liferaft with the chief officer inside. The raft was quickly dragged an estimated distance of 30 metres and suddenly the painter of the liferaft became detached.

Eventually nine crew members boarded the liferaft. An attempt was made to locate the victim but without success. At about 0715, the "ALGOWEST" located a liferaft through the fog and the survivors boarded the vessel.

17. The rescue of the crew members of the "COUDRES DE L'ÎLE" by the "ALGOWEST"

When the "COUDRES DE L'ÎLE" collided, the general alarm was sounded on board the "ALGOWEST" and all the crew members reported to their stations. A lifeboat was prepared for launching while other crew members were stationed as look-outs. Meanwhile, the master rang the engine 'astern'in order to return to the scene of the collision. Several VHF radio calls were made on channel 9 in order to communicate with the "COUDRES DE L'ÎLE" but without success.

Some time later, from the bridge of the "ALGOWEST, shouts and lifejacket whistle blasts could be heard through the fog. The master manoeuvred his vessel in the direction of

the shouts which were heard through the fog and afterward the liferaft containing the nine crew members of the "COUDRES DE L'ÎLE" was spotted. The port accommodation ladder was lowered and the liferaft made fast alongside and the nine survivors boarded the "ALGOWEST" at about 0715 and were then transferred to the CCGS "SIMON FRASER" at about 0915.

The "ALGOWEST" then remained at the scene to conduct a search to locate the missing person but without success. At about 1150, the "ALGOWEST" was authorized to leave the scene of the collision and to proceed to Baie-Comeau, her final destination.

18. Radar observations by the "CANADIAN LEADER" and "NORCHEM"

At the time of the collision, there were two other upbound vessels about 4 to 5 miles astern of the "COUDRES DE L'ÎLE". These two vessels, the "CANADIAN LEADER" and the "NORCHEM", were proceeding within the traffic lane recommended for upbound vessels. (See Annex 2)

The "CANADIAN LEADER" reported at Pointe au Boisvert at 0552 to the Les Escoumins VTS and the "NORCHEM" at 0602 on June 15, 1988.

(a) Radar observations by the "CANADIAN LEADER":

- up to Pointe au Boisvert, the "COUDRES DE L'ÎLE" was proceeding more than 3 miles to the north and parallel to the traffic lane recommended for upbound vessels;

- two radar targets were observed approaching one another about 5 miles distant and on a bearing of 12° to 15° to starboard of the "CANADIAN LEADER";

- the two radar targets merged into one and then reappeared again for a short while and, afterward, one of the two targets disappeared from the radar screen of the "CANADIAN LEADER".

(b) Radar observations by the "NORCHEM":

- the "NORCHEM" was overtaking the "CANADIAN LEADER" inside the traffic lane recommended for upbound vessels;

- the radar range was 6 miles;

- while the "CANADIAN LEADER" was on port beam of the "NORCHEM", a target was seen on the radar screen;

- the relative track of this target was observed veering north;

- a single radar target was observed to starboard while overtaking the "CANADIAN LEADER".

19. Search and rescue mission

The Quebec Search and Rescue Sub-Centre was alerted that there had been a collision between the "ALGOWEST" and the "COUDRES DE L'ÎLE" at about 0609. Following this information, intensive searches were conducted for two and a half days to find the cook, who is still missing and presumed drowned.

The units that participated in the searches were:

- the "SIMON FRASER", a Canadian Coast Guard Class 600 search and rescue vessel;

- the Canadian Coast Guard Class 400 search and rescue launch "ILE ROUGE";

- Canadian Coast Guard helicopters GC-123, GC-124 and GC-302;

- a Canadian Armed Forces "Labrador" R-302 helicopter;

- a Canadian Armed Forces Buffalo R-453 aircraft.

The area combed during this period stretched from Cap de Bon Désir, from the North Shore to the South Shore and up to Pointe au Boisvert, as well as an area along the South Shore up to Rimouski. The search ended at noon on June 17, 1988.

During the search, the Canadian Coast Guard surface units recovered the following debris:

- a ten-person RDF MK6 raft;

- five survival suits;

- two lifebuoys (one of these buoys was damaged and is now undergoing laboratory examination);

- a work lifejacket;

- eight keyhole-style lifejackets, seven of which were found in the raft;

- one mooring rope;

- two plastic gasoline containers;

- one tool box;
- one car seat;
- a parcel of lumber.

When abandoning ship, all had their lifejackets except the master who had only his bag containing a survival suit, and a crew member who was wearing a work lifejacket. It was noted that eight lifejackets were recovered, seven of which were in the liferaft, leading one to believe that the other lifejacket belonged to the victim. As some stated, the victim was wearing a lifejacket but it was not tied when she was last seen.

At the time of the alert, the Canadian Coast Guard Ship "SIMON FRASER" was at Ile Rouge, about 26 miles from the scene of the collision. The CCGS "ILE ROUGE" was at Tadoussac, about 29.5 miles away; the GCC-302 was at Les Escoumins, 11 miles away; the GCC-123 was at Rivière-du-Loup, 46 miles away; and No 413 squadron was at Summerside, Prince Edward Island, 291 miles from the scene of the collision; furthermore, the "NORCHEM" and the "CANADIAN LEADER" were about 5 miles east of the incident.

While the "SIMON FRASER" and the "ILE ROUGE" were heading toward the scene of the collision, the "CANADIAN LEADER" remained at the scene of the collision. The "SIMON FRASER" arrived at the scene at about 0830 and reported visibility at 100 metres whereas the "ILE ROUGE" arrived at the scene 15 minutes later at about 0845. At about 0915, the nine survivors were transferred onto the CCGS "SIMON FRASER".

For two and a half days, every effort was made to find the victim but without success.

20. Survival in cold water

The table on survival in cold water appearing in the Canadian Red Cross publication shows that in sea water at +8°C, as was the case when the "COUDRES DE L'ÎLE" sank, an average person has a strong chance of surviving, if he/she is rescued up to one hour after immersion. After two hours in the water, chances of survival are slim. (See Annex V.)

21. Regulations for the Prevention of Collisions

When the "ALGOWEST" and the "COUDRES DE L'ÎLE" collided, the two vessels involved had obligations that are clearly described in the Regulations for the Prevention of Collisions, the main rules of which are:

Rule 5

Look-out

> Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

This rule applies in any condition of visibility.

Neither the "ALGOWEST" nor the "COUDRES DE L'ÎLE" had stationed a look-out on the bow of the vessel. Navigation was mainly by radar. In the wheelhouse of the "COUDRES DE L'ÎLE", there were a helmsman and an officer of the watch. The two doors and all the windows were closed. On board the "ALGOWEST", there were the master, the officer of the watch and a helmsman. Some time before the collision, a seaman was stationed on the port side of the wheelhouse at the only window which was open, but he had received no instructions to pay special attention after a radar target was detected approaching dangerously close to the "ALGOWEST".

Rule 6

Safe Speed

> Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.

On June 15, 1988, at the time of the collision, there was a thick fog and visibility was so reduced that sometimes on board the "ALGOWEST", the bow of the vessel could not be made out. Despite these conditions the "ALGOWEST" and the "COUDRES DE L'ÎLE" were proceeding full speed ahead. A standard reference work on the Regulations for Preventing of Collisions at Sea gives the following interpretation:

> In restricted visibility a vessel making proper use of radar will normally be justified in going at a higher speed than that which would be acceptable for a vessel which does not have the equipment but not usually at the speed which would be considered safe for good visibility ...

Rule 7

Risk of Collision

(a) Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.

(b) Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.

(c) Assumptions shall not be made on the basis of scanty information, especially scanty radar information.

It was stated that the "ALGOWEST" had detected a faint radar target about 30° to port about 7 miles distant. Later, this target was seen dangerously approaching the heading marker of the "ALGOWEST". The course was then altered twice to starboard. This target proved later to be the radar target of the "COUDRES DE L'ÎLE" according to the navigating personnel of the "ALGOWEST".

This radar target 30° to port 7 miles distant, which the "ALGOWEST" reported having seen was certainly not the target of the "COUDRES DE L'ÎLE". Before the collision, the officer of the watch on board the "COUDRES DE L'ÎLE", after seeing the radar target of the "ALGOWEST" right ahead, also noticed a faint target to starboard some distance away at about 40° to 45°. Because of the course that the "COUDRES DE L'ÎLE" was following, it would have been physically impossible on board the "ALGOWEST" to detect the target of the "COUDRES DE L'ÎLE" 7 miles distant on a bearing of 30° to port because the "COUDRES DE L'ÎLE" would have been completely inside Baie Milles Vaches (see Annex 1). An analysis of the events shows that the target of the "COUDRES DE L'ÎLE" would have been about 5° to port of the "ALGOWEST". In the present case, neither carried out a radar plot and both drew conclusions based on scanty radar information. While the "ALGOWEST" was headed to starboard, the "COUDRES DE L'ÎLE" was headed to port.

Rule 8

Action to avoid Collision

Any action taken to avoid collision shall, if the circumstances of the case admit, be

positive, made in ample time and with due regard to the observance of good seamanship.

In the present case, the two vessels continued to proceed at full speed ahead despite the close-quarters situation which was developing. Neither one reduced speed before the collision. The only manoeuvre that the "ALGOWEST" made to avoid the collision was to alter course to starboard about 10° according to the course recorder, while the "COUDRES DE L'ÎLE" altered course about 25° to port.

Rule 19

Conduct of Vessels in Restricted Visibility

(d) A vessel which detects by radar alone the presence of another vessel shall determine if a close-quarters situation is developing and/or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when such action consists of an alteration of course, so far as possible the following shall be avoided:

(i) an alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken,

Before the collision, the "COUDRES DE L'ÎLE" altered course to port twice for the radar target of the "ALGOWEST" which was right ahead or nearly so, i.e. 10° and 15° respectively. The provisions of Rule 19(d)(i) permit a departure from this rule by the expression "so far as possible". However, it is important that such alteration of course to port be made positively and in good time so as to allow it to be observed by the other vessel.

Rule 35

Sound Signals in restricted Visibility
International

In or near an area of restricted visibility, whether by day or night, the signals prescribed in this Rule shall be used as follows:

(a) A power-driven vessel making way through the water shall sound at intervals of not more than 2 minutes one prolonged blast.

In the present case, the "ALGOWEST" sounded her sound signal every two minutes while the "COUDRES DE L'ÎLE" proceeded

without sounding the sound signal as prescribed in Rule 35(a).

22. Recommended Code of Nautical Procedures and Practices

This Code, 3rd edition, 1985, was published by the Canadian Coast Guard following the International Conference on Training and Certification of Seafarers, 1978.

In Part II, under the heading "Radar", the following is stated:

14. The officer of the watch should use the radar when appropriate and whenever restricted visibility is encountered or expected, and at all times in congested waters, having due regard to its limitations.

15. Whenever radar is in use, the officer of the watch should select an appropriate range scale, observe the display carefully and plot effectively.

And under the heading "Restricted Visibility":

23. When restricted visibility is encountered or expected, the first responsibility of the officer of the watch is to comply with the relevant rules of the applicable regulations for preventing collisions at sea, with particular regard to the sounding of fog signals, proceeding at a safe speed and having the engines ready for immediate manoeuvres. In addition, he should :

    (a) inform the master (see paragraph 24);

24. The officer of the watch should notify the master immediately in the following circumstances:

    (a) if restricted visibility is encountered or expected;

    (b) if the traffic conditions or the movements of other ships are causing concern.

Neither vessel carried out a radar plot which might have determined whether there was a risk of collision by determining the course and speed of the radar target.

On board the "ALGOWEST", the radar screen was not continuously observed after a target was detected to port. Although the radar target was observed by the navigating personnel on the bridge, no one person was designated to continuously monitor its approach on the radar screen. Thus, the gravity of the situation was not fully appreciated as no effort was made to slow the vessel.

The officer of the watch on the "COUDRES DE L'ÎLE" did not notify the Master of restricted visibility and did not sound the fog signals as prescribed in Rule 35(a) of the Regulations for the Prevention of Collisions.

23. VHF Radiotelephone Practices and Procedures Regulations

According to the Regulations, it is prescribed under the heading "Navigation Safety Call" as follows: ". . . every ship . . . that is maintaining a listening watch pursuant to section 8 shall make a navigation safety call on the frequency on which it is maintaining the listening watch

(a) when risk of collision with another ship is deemed to exist under those provisions of the Collisions Regulations that apply in an area being navigated by the ship;

(d) when doubt exists as to the the actions or the intentions of another ship;

In the present case, there was no radio communication before the collision between the "ALGOWEST" and the "COUDRES DE L'ÎLE".

24. Ships' Deck Watch Regulations

On board the "COUDRES DE L'ÎLE", there were three deck watches broken down as follows:

- the 8-12 watch was composed of the Master who holds a Certificate, Minor Waters, as well as a Master Mariner 'authorization' issued by Ship Safety, Canadian Coast Guard, permitting him to perform the duties of Master;

- the 12-4 watch was composed of a crew member without certificate; and

- the 4-8 watch was composed of the Chief Officer who holds a Watchkeeping Mate Certificate and an 'authorization' issued by Ship Safety, Canadian Coast Guard; an authorization not, in fact, required.

The 8-12 watch and the 4-8 watch were in compliance with section 8(1) of the Ships' Deck Watch Regulations. However, the 12-4 watch was kept by a crew member without certificate or 'authorization'. The 12-4 watch was not in compliance with section 8(1) of the Regulations which stipulates as follows under the heading "Qualifications of Navigational Personnel":

> 8.(1) Subject to subsection (5), no person shall act or be permitted to act as master or person in charge of the deck watch on a ship of more than 100 tons, unless he is

(a) the holder of a valid certificate or licence that is

(i) accepted by the Minister, and

(ii) appropriate for the duties to be performed, the class of the ship and the area in which the ship operates; and

(b) capable of properly operating the navigational equipment with which the ship is fitted.

In the present case, the second officer was without a certificate or an authorization to act as person in charge of the deck watch, but this did not contribute to the collision.

For his part, the master was not duly certificated for the class of home trade steamship, Class II, and it was for this reason that a 'authorization' had been issued to him under section 8(5) which reads as follows:

(5) An examiner may issue an authorization to a person to act

(a) as master, or

(b) as person in charge of the deck watch

where the Director, Ship Safety, Canadian Coast Guard, Department of Transport is satisfied that the person is as a result of his qualifications and experience, capable of performing the duties of master or person in charge of the deck watch, as the case may be.

25. **Routing of ships**

Ships in the vicinity of Les Escoumins are routed along recommended, non-regulatory routes. In addition, the Great Lakes Carriers Association has never wished to recognize these routes, particularly for vessels bound for Baie-Comeau.

In May and June of 1980, it was noted by VTS Les Escoumins that a majority of vessels which were downbound for Baie Comeau were not following the recommended traffic separation scheme. A survey of these vessels was conducted by VTS to determine why these vessels placed themselves in a potentially dangerous situation with regard to upbound traffic.

The results of the survey were as follows:

Destination	14
Must cross farther on	14
Weather	8
To save time	3
Regular route	5
Course not compulsory	1
Captain's orders	1
Pilot's recommendation	1
Other reasons	3
None of your business	1

TOTAL 51 vessels

At the time of the collision, the "ALGOWEST" was not complying with the recommended routes. Furthermore, Notices to Mariners, 1988 annual edition, Notice No 10, under the heading "Routing of Ships", gives the following warning in paragraph 1.2:

> Ships which depart from these routes and meet with collisions involve themselves in legal liability. Admiralty Courts have held that where traffic routing is observed for the common safety of ships and are recognized on official charts, "it is negligent navigation to leave them without reason".

Following a request in 1980 by the Dominion Marine Association, the Canadian Coast Guard issued a notice on how to proceed for vessels bound for Baie-Comeau. According to Coast Guard authorities, this notice was still in force at the time of the collision on June 15, 1988.

This advice (see Annex IV) had also been issued to the Les Escoumins VTS Centre, but the Canadian Coast Guard authorities in the Laurentian Region had not issued directives regarding its application to the regulators of the VTS Centre.

Concerning vessels that do not comply with a traffic routing system, it states as follows in the ship routing standards, published by the Canadian Coast Guard:

> Ships in waters under Canadian jurisdiction and Canadian ships in all other waters should supplement the signal 'YG' with bridge-to- bridge radiocommunications by using plain language as described in the 'Standard Marine Navigational Vocabulary' or by the phrase 'Interco-Yankee Golf'.

The signal 'YG' meaning 'You appear not to be complying with the traffic separation scheme' is provided in the International Code of Signals for appropriate use.

In addition, the Canadian rules on VHF radiotelephone between ships ask a vessel to contribute to the safety of the navigation of the vessel or another vessel by making calls. Appropriate use of a call between ships would consist in notifying another vessel that it does not seem to be complying with a traffic routing system and of notifying other vessels of this apparent infraction.

In the present case, it would have been prudent, because of the thick fog, to use a recommended route eastward rather than a route to the north where there was a possibility of meeting numerous fishing vessels that usually are in the area and because of the lack of sea room to manoeuvre between Les Escoumins and Pointe au Boisvert.

26. Background of the Les Escoumins radar monitoring centre and the vessel traffic services

From 1971 to 1973, four major casualties occurred in the region of the Les Escoumins pilotage station. This area was recognized as particularly dangerous because of converging upbound and downbound vessels that departed from their course either to embark or disembark pilots. There were risks of accident and pollution because weather conditions are often unfavourable owing to long foggy periods.

On October 20, 1971, the "ELIZABETH OLDENDORFF" ran aground; on August 25, 1972, a collision occurred between two foreign vessels, the "TOUSEI MARU" and the "FRUCUBA"; on September 2, 1972, another collision took place, this time between the "AEGIS WISDOM" and the "LYBIA"; and on July 4, 1973, another collision, when the "FLORENCE" collided with the "ST-SPYRIDON". As a result of the collision in July 1973 off Les Escoumins, active control of vessel traffic was recommended and the centre began its operations on May 1, 1974. Since then, no collision has been reported in this area up until the present case.

The 1974 radar monitoring centre was replaced by another on October 10, 1981, which was opened officially on June 4, 1982.

27. The Les Escoumins VTS Centre

The Les Escoumins VTS Centre is located at Anse-aux-Basques to monitor vessel traffic in two sectors. Sector 1 extends from Longitude 66° up to Pointe Manicouagan and Sector 1-A, where the collision occurred, extends from Pointe Manicouagan up to Ile Blanche, including the Saguenay River and the port of Chicoutimi.

The Les Escoumins vessel traffic services regional manual of operations is composed of two volumes. The first volume is the national vessel traffic services manual of operations

which gives the standards and procedures with which all VTS regulators in Canada must comply and follow. Volume 2 contains local and regional directives. When chapters, sections or subsections are omitted in Volume 2, the chapters, sections or subsections of Volume 1 apply.

In the present case, reference must be made to the national vessel traffic services manual of operations concerning the responsibilities of the supervisor and regulator which reads as follows: the supervisor is responsible to the officer in charge of the centre for:

- supervising and providing guidance to subordinate centre personnel;

- ensuring that VTS services are being provided in accordance with approved policies, standards and procedures;

- ensuring that the work is performed in accordance with established standards and that operational staff are qualified or under direct supervision.

Marine traffic regulators are responsible to the watch Supervisor for:

- regulating vessel traffic within the zone;

- operating and monitoring electronic equipment;

- issuing advice, directives/instructions, clearances and other information.

On the morning of the collision, the "ALGOWEST" reported to the Les Escoumins VTS at about 0500 to inform the regulator that she was leaving the pilotage station and at the same time, asked for information on traffic upbound toward Les Escoumins.

The regulator replied that the closest upbound vessel was the "ALGOBAY" and the other vessel was the "CAST POLAR BEAR" 10.8 miles east of the station.

Following this information, the "ALGOWEST" informed the Les Escoumins VTS of her planned course north of the area of the recommended route for upbound vessels and that she would be off Pointe au Boisvert in 1 hour and 40 minutes.

At that time, there were three other vessels that had reported at the Pointe à Michel reporting point upbound toward Pointe au Boisvert, namely the following vessels:

- "COUDRES DE L'ÎLE" at 0243 with estimated time of

arrival for Pointe au Boisvert of 0510;

- "CANADIAN LEADER" at 0319 with estimated time of arrival for Pointe au Boisvert of 0610;

- "NORCHEM" at 0359 with estimated time of arrival for Pointe au Boisvert of 0610.

None of these three vessels was reported by the regulator of the Les Escoumins VTS to the downbound "ALGOWEST". This is contrary to the Les Escoumins VTS regional manual of operations which reads as follows:

6.2.5 Information to traffic

6.2.5.3.1.1. When the regulator gives the traffic in the opposite direction, he gives the traffic bound for the point of passage of the vessel, as well as the expected traffic at the next reporting point. (Free translation)

As this traffic was not transmitted to the downbound vessel "ALGOWEST" by VTS, and as the transmissions from the three upbound vessels to VTS were reported not to have been heard by the navigating personnel of the"ALGOWEST", they remained unaware of the presence of the "COUDRES DE L'ILE" until she was detected by radar.

Furthermore, when the "COUDRES DE L'ÎLE" reported at Pointe au Boisvert, upbound toward Les Escoumins 0520, the regulator simply informed her of a vessel downbound for Pointe au Boisvert, which was the "ALGOWEST", without informing her that the "ALGOWEST" was downbound north of the area of the recommended route for upbound vessels.

At about 0603, the "ALGOWEST" called the "COUDRES DE L'ÎLE" after the collision when the latter put out a hurried call to the Les Escoumins VTS.

The regulator answered the call from the "COUDRES DE L'ÎLE" but the latter did not answer because the wheelhouse had already been evacuated. At about 0604, the "ALGOWEST" reported the collision to the Les Escoumins VTS and a minute later, at about 0605, following the request from the tug "LAVAL" which was asking where the "COUDRES DE L'ÎLE was, the regulator informed her that the "COUDRES DE L'ÎLE" was about 7.2 miles below the station.

On the morning of the collision, the radar target of the "COUDRES DE L'ÎLE" was not seen by the regulator on his radar screen and if there were detection problems on the morning of the collision, neither the supervisor's log nor the regulator's log mentioned them, as prescribed in the regional manual of operations for the Les Escoumins VTS

Centre which reads as follows:

"The marine traffic regulator on duty in Sector 1A shall check the functioning of the radar and the tracking system; he shall enter in the log any drop in performance below established standards and shall advise the supervisor thereof as soon as possible." (Free translation)

Lastly, at about 0627, a PAN message was sent to all vessels and was broadcast on the Les Escoumins VTS channel and the text read as follows:

"To all vessels: This is channel Les Escoumins, the vessel "ALGOWEST" and the vessel "COUDRES DE L'ÎLE" collided at position Latitude 48°26' North and Longitude 68° 12' West; please proceed with caution . . ."

In the first PAN message, it is noted that there was an mistake in the position, when the longitude was broadcast as being 68°12' West, rather than 69°12' West. This mistake was corrected in subsequent messages.

28. The radar system and the tracking device at the Les Escoumins VTS

(i) Brief description of the system

The radar equipment was manufactured by CSF Thompson of France, model TRS 3405, guaranteeing a coverage radius ranging from 6 to 20 miles, depending on the nature and size of the target, as well as ambient weather conditions.

In addition, there is a tracking system designed by Leigh Instruments and capable of tracking up to 40 targets at the same time and providing, on request, an assessment of the risk of collision after the controller has acquired the necessary data.

The radar-related characteristics were checked in 1981, during performance tests, and the equipment met all the parameters, as described in the radar's operational specification.

(ii) Performance of the radar equipment

The present radar system was recently studied in order to examine the operational characteristics to ascertain a probable cause of the radar target detection problem in the vicinity of Les Escoumins VTS. On the morning of the collision, the regulator on duty at the Les

Escoumins VTS reported that the radar target of the upbound "COUDRES DE L'ÎLE" was not seen on the PPI and tracked before the collision.

Following an examination of the radar installation and the study report and other documents on the present system, the following factors regarding the non-detection of the target of the "COUDRES DE L'ÎLE" on the radar screen must be considered:

The tilt of the radar antenna appears to have been adjusted downward an estimated -3°. The effect of this was to have the radar beam below the horizon. The vertical beam is some 2.5° and its upper part has a clear power cut-off.

As the antenna was tilted downward, long-range detection would be reduced, particularly in unfavourable weather conditions.

The PPI of the radar at the regulator's position seems to have poor brightness characteristics for long-range targets and combined with the slowness of rotation of the antenna, a faint target might not be seen by the regulator.

The afterglow of the brightness of the regulator's PPI seems to be less than specification based on an examination of the operational characteristics of the radar equipment, as well as that on the, separate, maintenance PPI screen.

The ambient light conditions at the regulator's position are relatively high in contrast with the brightness of the PPI. This may also make it difficult to observe radar targets.

During a shift, the regulator has a number of other duties when monitoring of the radar screen has to be interrupted.

The speed of rotation of the antenna is 6 or 12 revolutions per minute and the 6-revolution speed is nearly always used.

(iii) Loss of radar echo

According to the operational characteristics of the Les Escoumins radar, in foggy weather, with visibility at 30 metres, a 10 m^2 target that is 3 metres above water level can be detected at 18 miles.

On August 4, 1988, in foggy weather, the "SEAWAY QUEEN", 218.612 metres in length, and the "FIONA", 87.61 metres in length, both upbound for Les Escoumins, were detected at only 13 miles to the east of the radar station.

On August 31, 1988, at about 0800, when a Transport Canada marine investigator was at the Les Escoumins VTS Centre, he observed the loss of a radar target of a tug on the regulator's radar screen. The radar echo of a tug of British nationality, the "LORNA B", 42.91 metres in length, disappeared from the radar screen about 1.2 miles northeast of the radar station and reappeared about 2 miles west of the station. The weather was clear, the sea calm and visibility good.

On October 28, 1988, the CCGS "SIMON FRASER", the dimensions of which are similar to those of the "COUDRES DE L'ÎLE", was used as radar target in relatively good weather conditions. The target of the CCGS "SIMON FRASER" was detected at a distance of 28 miles east, and the target was observed constantly on a course similar to the course of the "COUDRES DE L'ÎLE" on her last voyage on June 15, 1988.

29. Stability booklet of the "COUDRES DE L'ÎLE"

After the violent impact of the collision, the "COUDRES DE L'ÎLE" listed dangerously before sinking quickly, resulting in the disappearance of the vessel. At the time of the collision, the vessel was carrying a cargo mainly of old crushed cars in the hold and on deck.

At that time, the "COUDRES DE L'ÎLE" did not have on board a stability booklet approved by the Steamship Inspection Authority. However, she had a number of stability documents in the form of handwritten tables, the source and accuracy of which could not be verified. The "COUDRES DE L'ÎLE" had been in service in Canada for about 16 years and her stability had never been questioned.

At the inspection of the "COUDRES DE L'ÎLE" on April 5, 1988, by Canadian Coast Guard inspectors, a short-term inspection certificate was issued and was valid until June 4, 1988, awaiting the submission of stability documents.

On May 25, 1988, the inspection certificate of the "COUDRES DE L'ÎLE" was once again extended by the authorities and was to expire on August 4, 1988 for the same reason.

During this time, a naval architect from a private firm had been orally instructed by the owner to produce a stability booklet.

The architect was unable to produce one without a hull plan and was waiting to be able to carry out a stability test on the vessel when she sank after the collision with the "ALGOWEST" on June 15, 1988.

30. Qualifications of the victim

She held an "A" and "B" certificate as a ships' cook issued by the Institut du Marine du centre de Québec in 1983 and 1985 respectively.

Also, on April 26, 1985, a training course certificate (EXN 24) had been issued to her by the Institut de marine du Québec, St-Romuald centre, after completing the Marine Emergency Duties II course, Parts "A", "B" and "C".

The victim had begun sailing in 1983 and she embarked as cook in early April 1988 on board the "COUDRES DE L'ÎLE". She was known as a moderately good swimmer.

31. Qualifications of the officers

The "ALGOWEST" had on board duly certificated officers for the class of inland waters voyage.

The master of the "ALGOWEST" has been sailing for 39 years and he holds a Canadian Master Certificate of Competency, Inland Waters, issued in 1959. He has been navigating as master since 1974 and master of the "ALGOWEST" since 1982.

The chief officer of the "ALGOWEST" holds a Canadian Master Certificate, Inland Waters, issued in 1977. As master from 1979 to 1984 and since that time, as chief officer, employed by Algoma.

The master of the "COUDRES DE L'ÎLE" has been sailing since 1961 and he holds a Canadian Master Certificate of Competency, Minor Waters, issued in 1986. He sailed as seaman from 1961 to 1964. Later, he navigated as first officer without certificate on board small coasting vessels. He had been master of the "COUDRES DE L'ÎLE" since 1986.

The chief officer of the "COUDRES DE L'ÎLE" holds a Canadian Watchkeeping Mate Certificate issued in October 1986. He has about 12 months sea service. He had graduated from the Institut maritime du Québec in 1986 but he did not sail the following year in 1987. He embarked on the "COUDRES DE L'ÎLE" in April 1988 as chief officer.

The "COUDRES DE L'ÎLE" had an inspection certificate for

Class II coastal trade voyages. Since the master was not duly certificated for this class of coastal trade voyage, an 'authorization' had been issued to him by a Canadian Coast Guard inspector under section 8(5) of the Ships' Deck Watch Regulations, to perform the duties of master. The authorization was dated to expire on August 21, 1988. A second authorization had been issued to the chief officer but it was issued by mistake. Because the tonnage of the vessel was less than 400 registered tons and because the chief officer held a Watchkeeping Mate Certificate issued in 1986, it was not necessary to have an authorization.

Findings

On June 15, 1988, in heavy fog conditions, a collision occurred below Les Escoumins between the "ALGOWEST" and the "COUDRES DE L'ÎLE". The latter sank quickly and one person was found to be missing.

It would appear that this collision took place because the two vessels did not make proper use of the radar equipment with which they were fitted in that:

- neither vessels did not analysed and/or interpreted correctly the information provided by the radar;

- on board the "ALGOWEST", the fact that the radar was not continuously monitored by a designated officer after a target was detected to port contributed to an incomplete appreciation of the developing dangerous situation.

It would appear that in the course of the events that led to the collision, the two vessels did not observe certain rules of the International Regulations for Preventing Collisions at Sea with Canadian Modifications, as follows:

- the two vessels did not ensure a proper look-out as required in Rule 5;

- the two vessels did not comply with the safe speed prescribed in Rule 6 by proceeding at full or at almost full speed ahead in the thick fog;

- the two vessels did not comply with Rule 7(a), (b) and (c) by not carrying out any radar plotting and by drawing conclusions from scanty radar information;

- the two vessels did not manoeuvre in accordance with Rules 8 and 19 concerning action to avoid a collision;

- on board the "COUDRES DE L'ÎLE", the sound signal was not sounded as prescribed in Rule 35(a); and

- the two vessels did not use the radio equipment before the collision, as prescribed in Rule 9(a) and (d) of the VHF Radiotelephone Practices and Procedures Regulations.

Other findings

The "ALGOWEST" had not been notified by the Les Escoumins VTS that the "COUDRES DE L'ÎLE", the "CANADIAN LEADER" and the "NORCHEM" were upbound for Pointe au Boisvert, but each of these vessels had reported at the reporting point.

The Les Escoumins VTS Centre is equipped with a radar and it would appear that the target of the "COUDRES DE L'ÎLE" was not seen on the radar screen before or after the collision.

Since it was put into operation, it appears that the Les Escoumins radar equipment has had a radar target detection problem.

An investigation, which took place in 1980, revealed that most Canadian vessels, mainly bound for Baie-Comeau, do not comply with the recommended routes between Les Escoumins and Pointe au Boisvert.

On leaving the pilotage station, the downbound "ALGOWEST" headed toward the lane recommended for upbound vessels.

Without an adequate look-out and without sounding sound signals, the "COUDRES DE L'ÎLE" was proceeding with the doors and windows of the bridge closed.

The master of the "COUDRES DE L'ÎLE" was not notified by the officer of the watch of restricted visibility as prescribed in section 24 of Part II of the Code of Nautical Practices and Procedures.

Rather than a simple call to the Les Escoumins VTS, the "COUDRES DE L'ÎLE", in the circumstances, should have sent out a distress call composed of the word 'MAYDAY' on the VTS working frequency.

All the survivors of the "COUDRES DE L'ÎLE" were wearing lifejackets, except the master, and no crew member used a survival suit because of the speed at which the vessel sank.

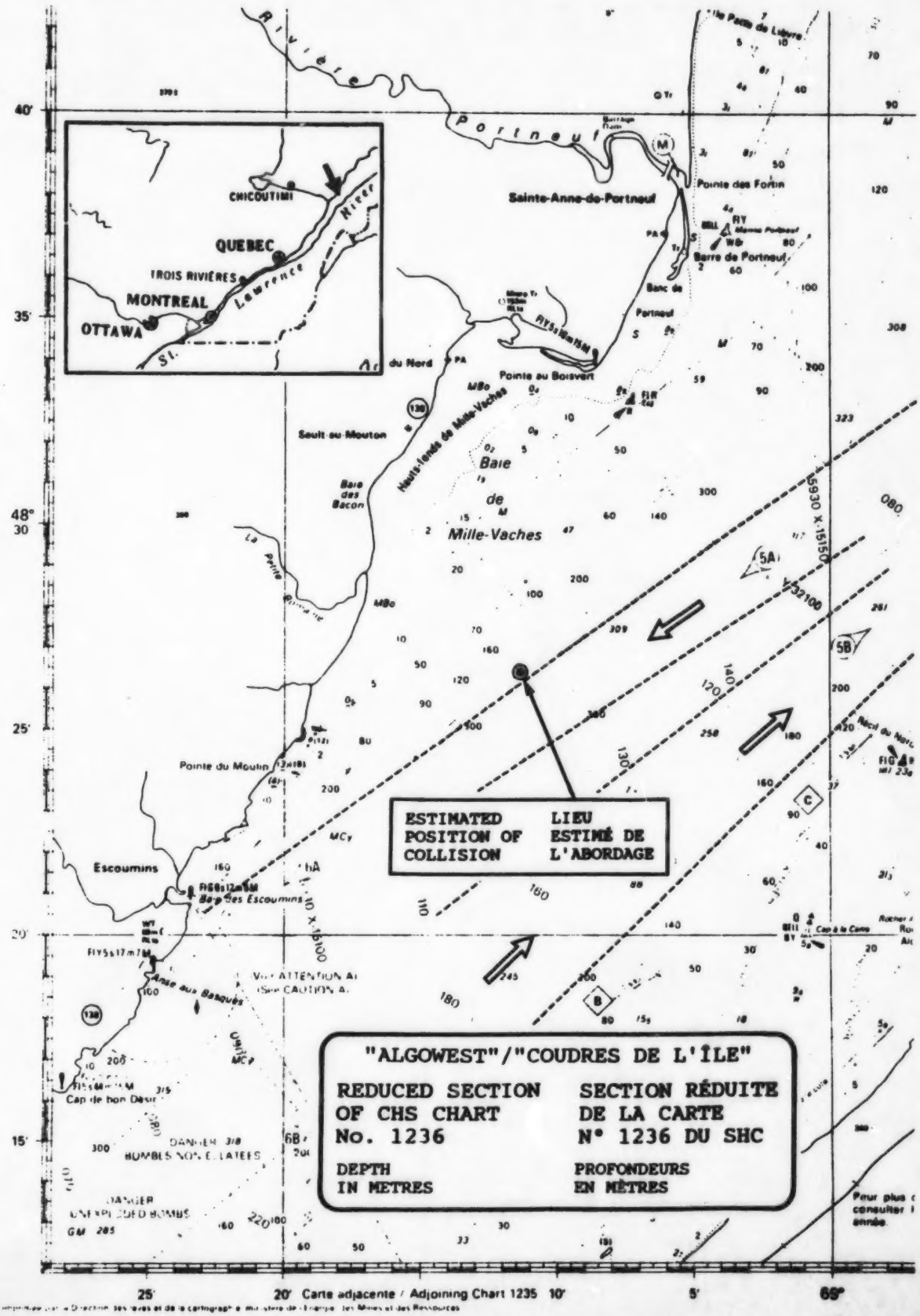
At the time of the collision, the "COUDRES DE L'ILE" had a short-term inspection certificate, issued by Ship Safety, Canadian Coast Guard, while waiting for information on the stability of the vessel to be submitted.

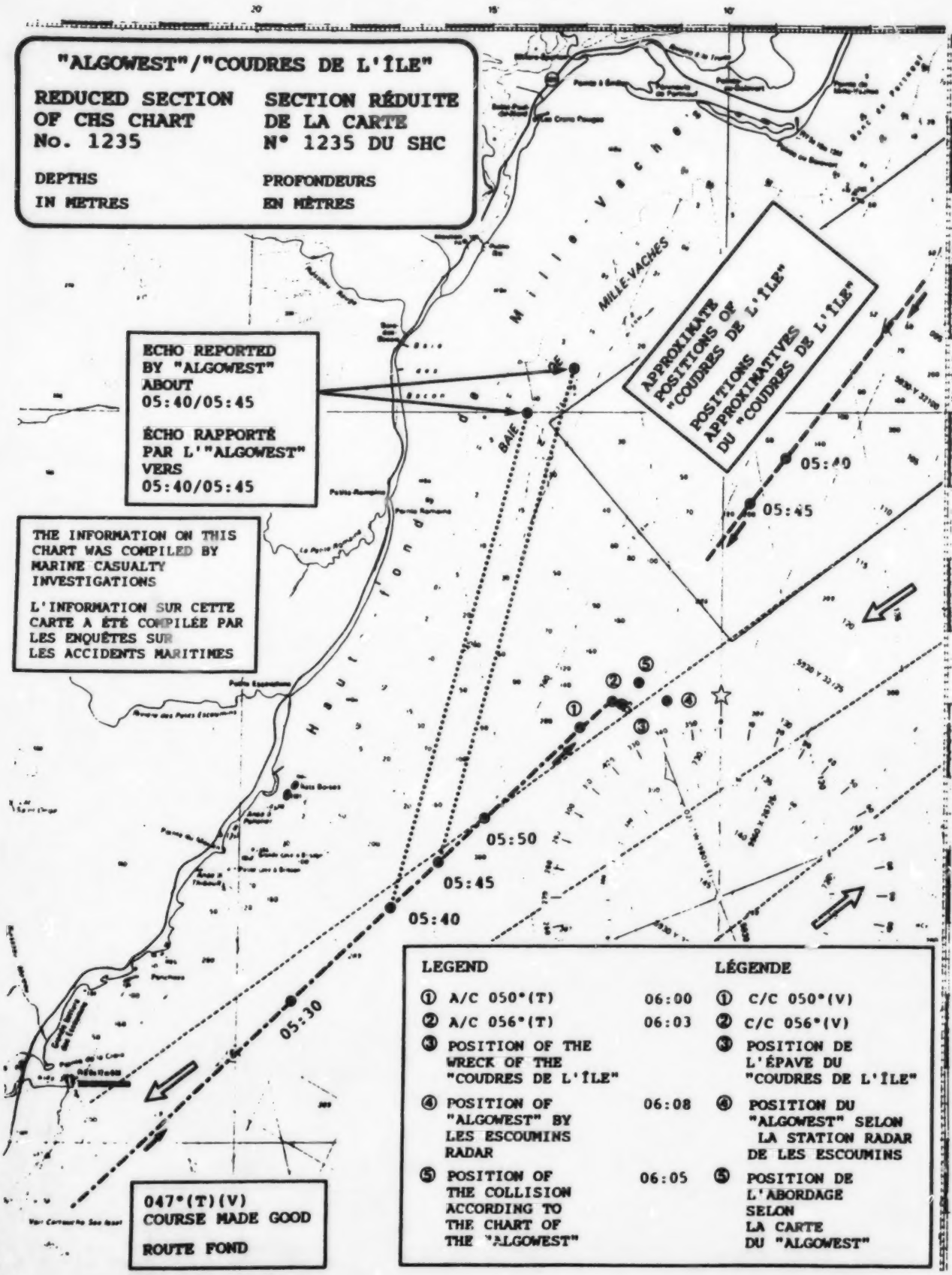
The victim, probably in a state of shock, did not tie her

lifejacket, and did not jump overboard, going down with the vessel.

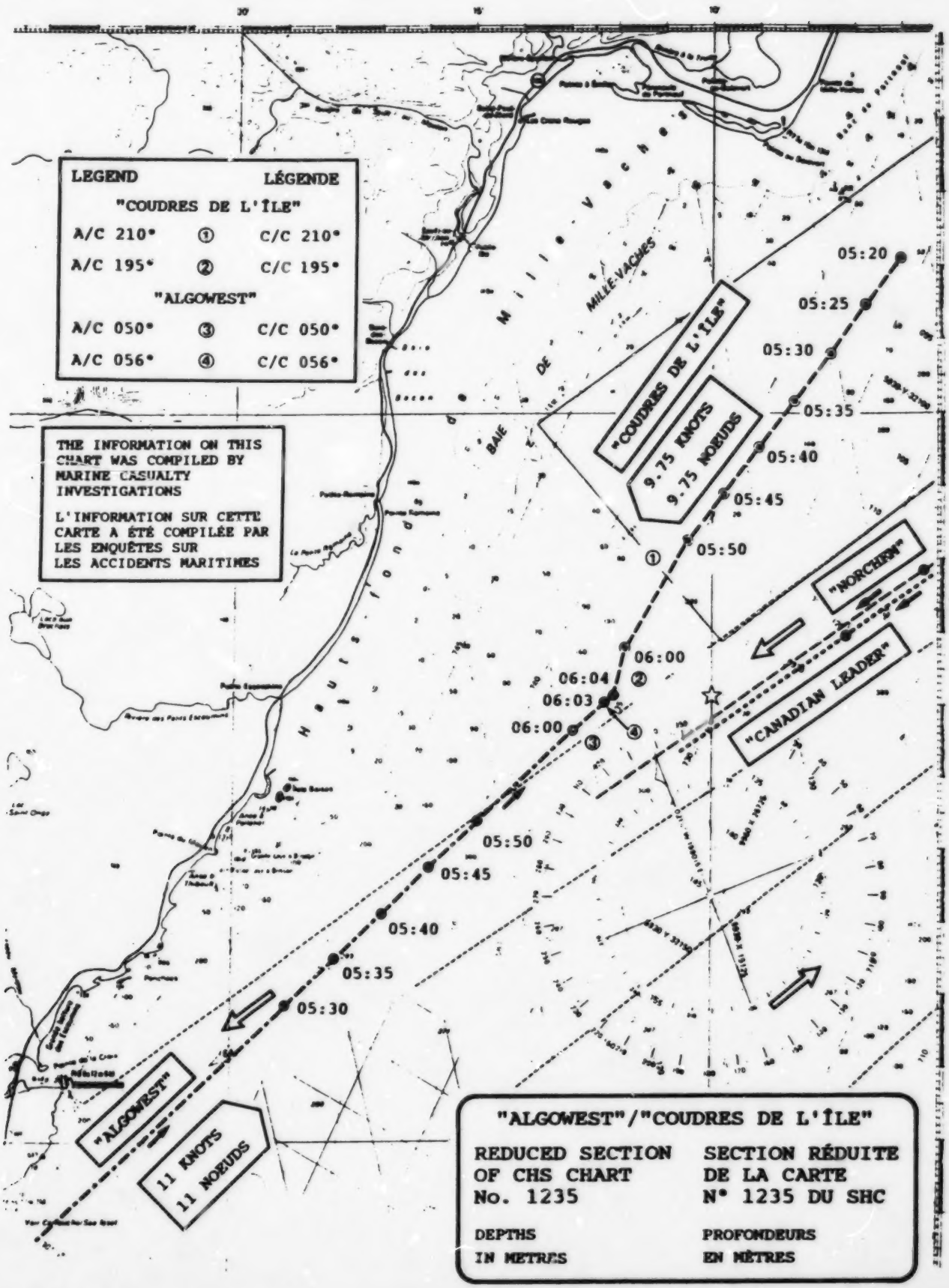
MARINE CASUALTY INVESTIGATIONS
TRANSPORT CANADA
110 O'CONNOR
OTTAWA, ONTARIO
K1A 0N5

MARCH 1989


CHICOUTIMI
QUEBEC
TROIS RIVIÈRES
MONTREAL
OTTAWA
Saguenay River
St. Lawrence
Rivière Portneuf
Sainte-Anne-de-Portneuf
Pointe des Forin
Barre de Portneuf
Banc de Portneuf
Pointe au Boisvert
Haut-fonds de Mille-Vaches
Sault au Mouton
Baie de Mille-Vaches
Baie des Bacon
Pointe du Moulin
Escoumins
Baie des Escoumins
Anse aux Basques
Cap de bon Désir
DANGER
UNEXPLODED BOMBS
ESTIMATED POSITION OF COLLISION
LIEU ESTIMÉ DE L'ABORDAGE
"ALGOWEST"/"COUDRES DE L'ÎLE"
REDUCED SECTION OF CHS CHART No. 1236
SECTION RÉDUITE DE LA CARTE N° 1236 DU SHC
DEPTH IN METRES
PROFONDEURS EN MÈTRES
Carte adjacente / Adjoining Chart 1235
40'
35'
48° 30'
25'
20'
15'
25'
20'
10'
5'
68°


"ALGOWEST"/"COUDRES DE L'ÎLE"
REDUCED SECTION OF CHS CHART No. 1235
SECTION RÉDUITE DE LA CARTE N° 1235 DU SHC
DEPTHS IN METRES
PROFONDEURS EN MÈTRES
ECHO REPORTED BY "ALGOWEST" ABOUT 05:40/05:45
ÉCHO RAPPORTÉ PAR L'"ALGOWEST" VERS 05:40/05:45
APPROXIMATE POSITIONS OF "COUDRES DE L'ÎLE"
POSITIONS APPROXIMATIVES DU "COUDRES DE L'ÎLE"
THE INFORMATION ON THIS CHART WAS COMPILED BY MARINE CASUALTY INVESTIGATIONS
L'INFORMATION SUR CETTE CARTE A ÉTÉ COMPILÉE PAR LES ENQUÊTES SUR LES ACCIDENTS MARITIMES
MILLE-VACHES
BAIE DE
HAUT FOND
05:40
05:45
05:50
05:30
047°(T)(V)
COURSE MADE GOOD
ROUTE FOND
LEGEND
① A/C 050°(T) 06:00
② A/C 056°(T) 06:03
③ POSITION OF THE WRECK OF THE "COUDRES DE L'ÎLE"
④ POSITION OF "ALGOWEST" BY LES ESCOUMINS RADAR 06:08
⑤ POSITION OF THE COLLISION ACCORDING TO THE CHART OF THE "ALGOWEST" 06:05
LÉGENDE
① C/C 050°(V)
② C/C 056°(V)
③ POSITION DE L'ÉPAVE DU "COUDRES DE L'ÎLE"
④ POSITION DU "ALGOWEST" SELON LA STATION RADAR DE LES ESCOUMINS
⑤ POSITION DE L'ABORDAGE SELON LA CARTE DU "ALGOWEST"

ANNEX II APPENDICE II



ANNEX III

The owner of the "COUDRES DE L'ÎLE" registered his vessel in Canada in 1972, and in conformity with the Regulations at that time, a vessel which became Canadian by registration was considered as a new vessel. At that time the "COUDRES DE L'ÎLE" was defined as such on her arrival in Canada. Following her first inspection in 1972, the Ship Safety Inspector required, amongst other things, information relative to the stability of the vessel and this requirement was confirmed in February 1973 by the Board of Steamship Inspection. In March 1973, the owner supplied information on righting arm-values (GZ) to the Canadian Coast Guard at Quebec.

From March 1973 to the spring of 1987, it appears that the Board of Steamship Inspection made no request to the owner for information relative to the stability of the vessel "COUDRES DE L'ÎLE".

In spring 1987, while the "COUDRES DE L'ÎLE" was loading a deck cargo at Port Cartier, she was visited by a Canadian Coast Guard marine surveyor. During his visit, the surveyor discovered that the vessel did not have stability information in a form approved by the Board of Steamship Inspection and he reported this to the authorities. In October 1987, the regional office of the Canadian Coast Guard wrote to the owner so that a stability experiment be carried out in the presence of a marine surveyor and, following this experiment, a stability booklet would be submitted for approval in conformity with Part VII of the Hull Construction Regulations and, also, Stability, Subdivision, and Load Line Standards .

During the 1987 navigation season, the Canadian Coast Guard issued short termed Convention Certificates four (4) times to the "COUDRES DE L'ÎLE" for international voyages between Montréal and Saint-Pierre et Miquelon. During these voyages, the "COUDRES DE L'ÎLE" had an International Load Line Certificate (1966) and in conformity with the Load Line Regulations (Sea), the following is prescribed in article 10, paragraph (2) of schedule 1:

> The master of every new ship which is not already provided with stability information under an international convention for the safety of life at sea in force shall be supplied with sufficient information in an approved form to give him guidance as to the stability of the ship under varying conditions of service, and a copy shall be furnished to the Administration.

According to the owner, the "COUDRES DE L'ÎLE" arrived in Canada in 1972 with stability information in Dutch and the Canadian Coast Guard then accepted the vessel 'as is'. During this

period, i.e. from 1972 until her loss in 1988 after the collision, according to the owner, the "COUDRES DE L'ÎLE" did not undergo major modifications which could have influenced the vessel's stability, except for the following:

- a change of loading winches in 1973;
- the loading derricks were reinforced in 1973;
- improvement of the floor ceiling in 1978.

In the course of the inquiry, certain documents were obtained, amongst which were, the result of a stability test carried out in 1970 for the "COUDRES DE L'ÎLE" at that time named "FERNFIELD" as well as stability documents in Dutch for the vessel "EIBERGEN", a sister ship built in Holland in 1954 and which was lost in 1962.

In spite of this information, the naval architect, commissioned by the owner to produce a stability booklet for the "COUDRES DE L'ÎLE", judged that the vessel should be the object of a stability experiment because this information was not recent and as the vessel could have undergone modifications during the years which could have had an influence on her centre of gravity.

To summarize, at the time of the collision the "COUDRES DE L'ÎLE" had but one hold and the ballast tanks were completely filled with liquid ballast because of her deck cargo. Once the watertight integrity of the hold was lost, and when combined with its massive flooding, the "COUDRES DE L'ÎLE" sank rapidly.

It should be underlined that, once seriously damaged, a vessel's transverse stability does not much matter as she rapidly loses this initial stability. Currently there are no subdivision and damaged stability requirements for dry cargo vessels similar to those required for passenger vessels.

ANNEX IV

Ships' Routing from Les Escoumins to Baie-Comeau

1 Request for guidance

1.1 The Coast Guard has been asked for guidance on the proper courses for ships proceeding eastbound from Les Escoumins to Baie-Comeau.

1.2 Routing measures cannot generally be established for each individual port along a major shipping route. Mariners should therefore make the best and most practical use of established routes when the ship's destination lies to one side of a route such as in the case of Baie-Comeau.

2. Suggested course from Les Escoumins to Baie-Comeau

2.1 Ships leaving Les Escoumins should join the eastbound traffic lane and follow this lane until abeam of I. du Bic. This course will take the eastbound ship well clear of the westbound traffic approaching Les Escoumins. There is insufficient room for eastbound ships to set a safe course between the westbound traffic lane and the north shore.

2.2. From I. du Bic the ship can alter course to port and cross the westbound traffic lane as quickly as possible, pass outside the routing system and then set a course to Baie-Comeau. Before crossing the westbound lane the ship must ensure it is safe to do so and if necessary make use of its bridge-to-bridge radiotelephone to warn other ships in the area. CHANNEL ESCOUMINS should be informed of the ship's intention to leave the routing system when reporting at point "5B".

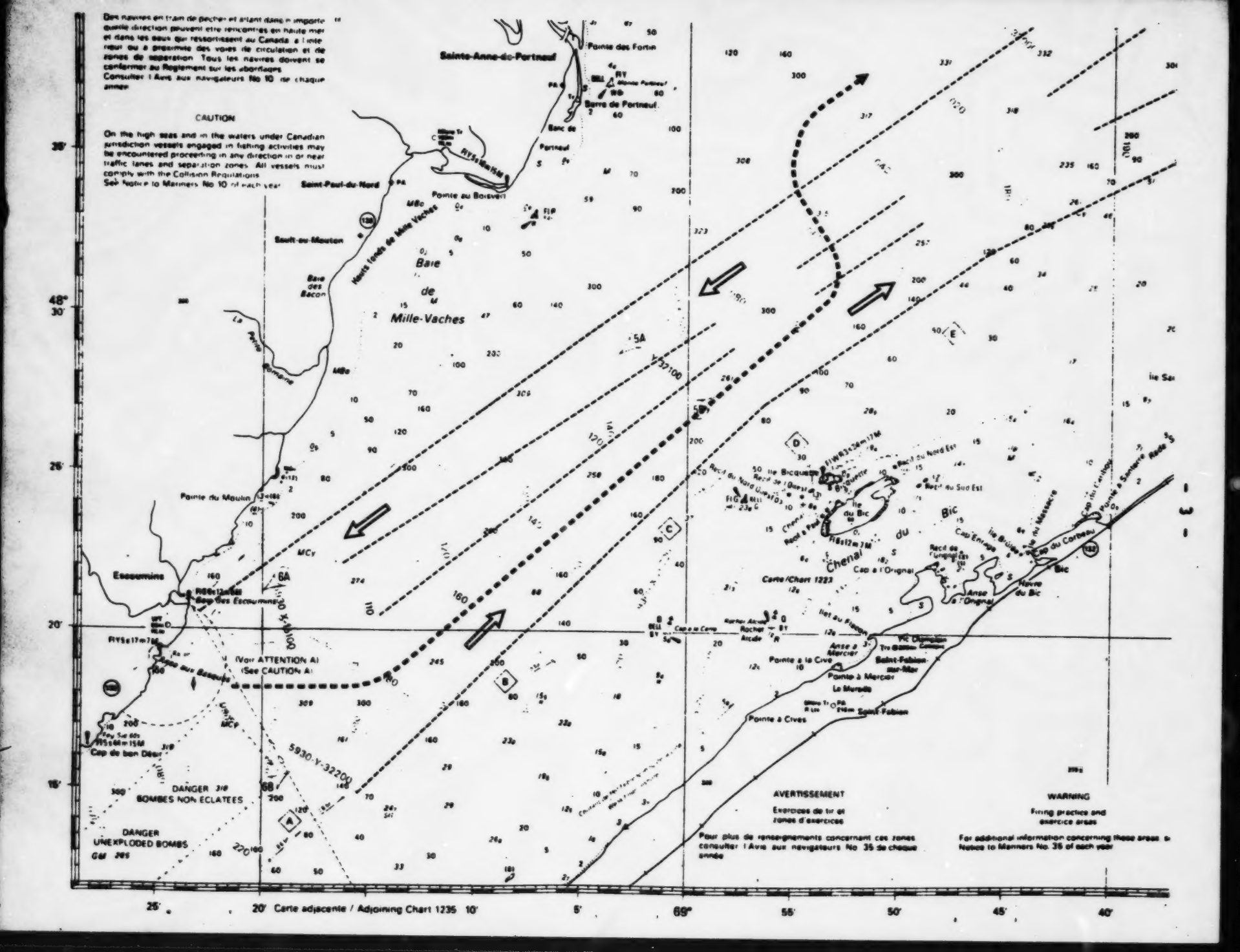
2.3 Ships are reminded that when not using a traffic separation scheme they shall avoid it by as wide a margin as is practicable.

2.4 The attached chart of the area is not for the purpose of establishing a track but only to illustrate the guidance described in these paragraphs.

3 Future amendments to the Gulf and River St. Lawrence Routing System

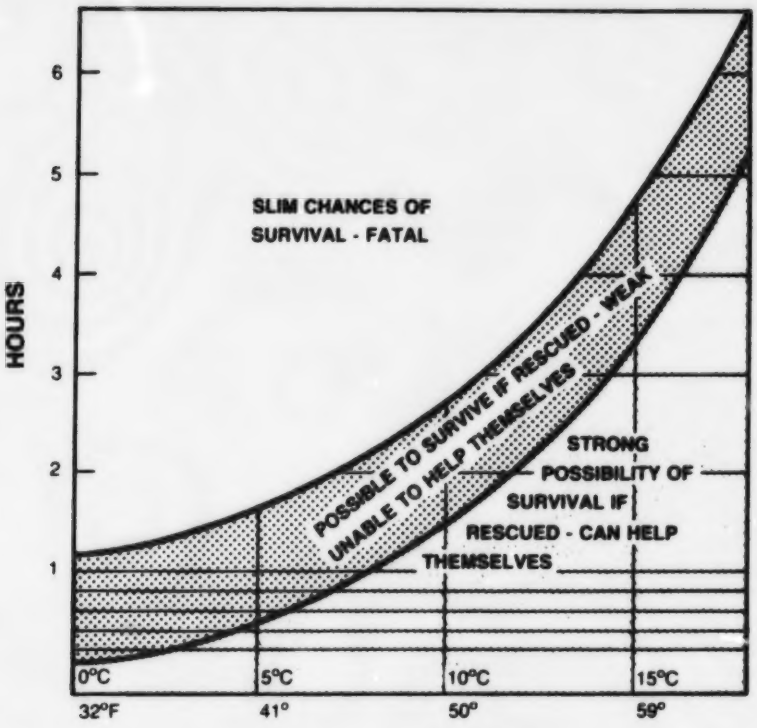
3.1 This system has been under review for several years. One proposal is to provide a separate system for north shore traffic in order to make the routing system serve this area more effectively.

3.2 Initial drafts show that there is insufficient space for two separate systems but that it may be possible to route the lanes more closely to the middle of the river and delete the south shore outbound lane.


Des navires en train de pêcher et allant dans n'importe quelle direction peuvent être rencontrés en haute mer et dans les eaux qui ressortissent au Canada à l'intérieur ou à proximité des voies de circulation et de zones de séparation. Tous les navires doivent se conformer au Règlement sur les abordages.
Consulter l'Avis aux navigateurs No 10 de chaque année
CAUTION
On the high seas and in the waters under Canadian jurisdiction vessels engaged in fishing activities may be encountered proceeding in any direction in or near traffic lanes and separation zones. All vessels must comply with the Collision Regulations.
See Notice to Mariners No 10 of each year
Sainte-Anne-de-Portneuf
Pointe des Forts
Barre de Portneuf
Banc de Portneuf
Saint-Paul-de-Nord
Pointe au Boisvert
Sault-au-Mouton
Baie des Bacon
Hauts fonds de Mille Vaches
Baie de Mille-Vaches
La Petite Romaine
Pointe du Moulin
Escoumins
Cap des Escoumins
Cap de bon Désir
Pointe aux Basques
(Voir ATTENTION A)
(See CAUTION A)
DANGER
BOMBES NON ÉCLATÉES
DANGER
UNEXPLODED BOMBS
Carte/Chart 1223
Cap à l'Original
Anse à l'Original
Havre du Bic
Chenal du Bic
Ile du Bic
Ile Bicquette
Cap du Corbeau
Pointe à Mercier
Pointe à la Cive
Pointe à Cives
Saint-Fabien
Saint-Fabien-sur-Mer
Le Marais
Anse à Mercier
Ilet au Plaisir
Cap de la Carry
5930-Y-32200
5930-Y-32100
AVERTISSEMENT
Exercices de tir et zones d'exercices
Pour plus de renseignements concernant ces zones consulter l'Avis aux navigateurs No 35 de chaque année
WARNING
Firing practice and exercise areas
For additional information concerning these areas see Notice to Mariners No. 35 of each year
Carte adjacente / Adjoining Chart 1235
48° 30'
48° 20'
48° 10'
69°
68°
25'
20'
15'
10'
5'
55'
50'
45'
40'

ANNEX V

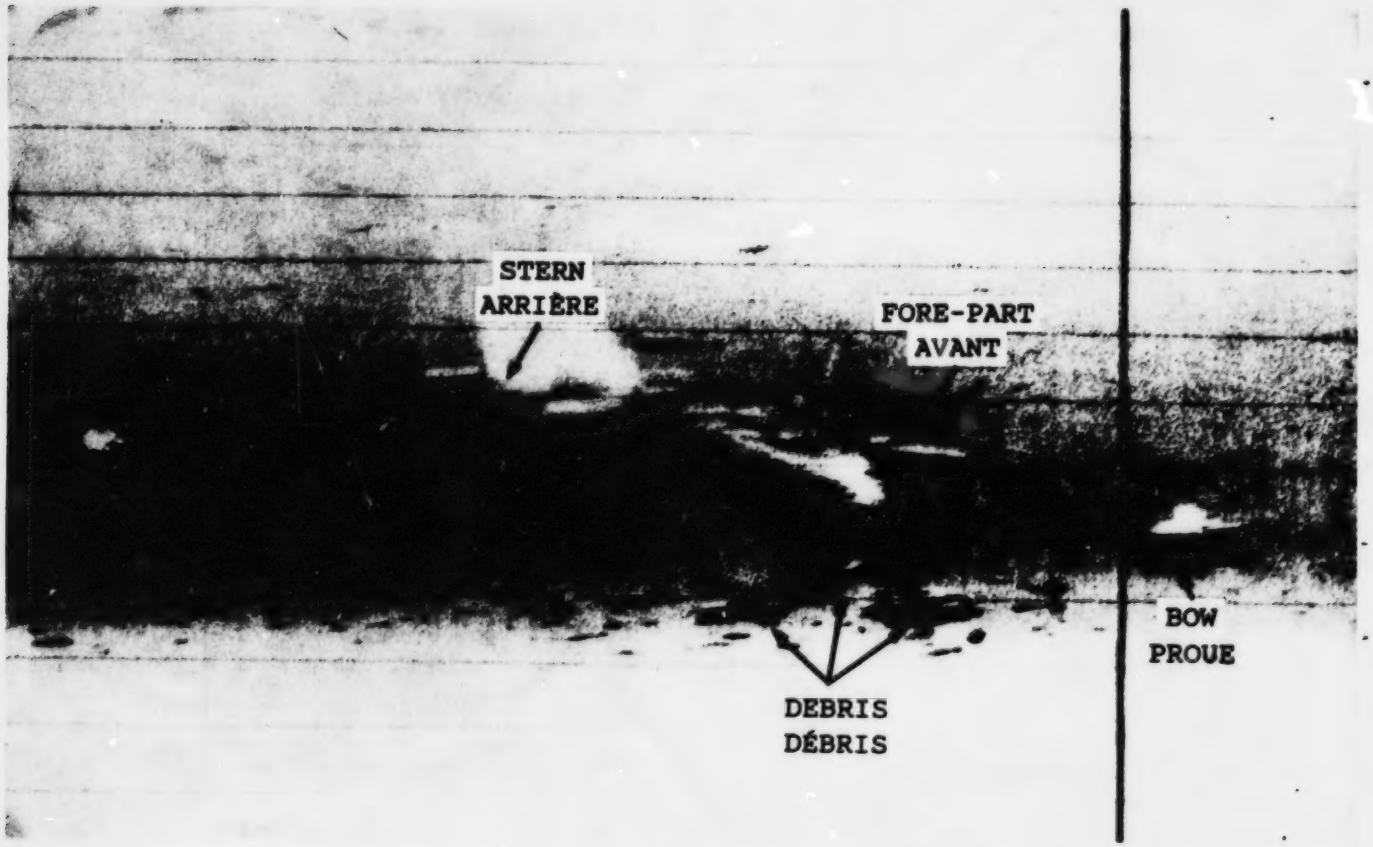
COLD WATER SURVIVAL



The accompanying graph shows average predicted survival times of average, adult humans in water of different temperatures. The figures are based on experimental cooling of average men and women who were holding still in ocean water and wearing a standard lifejacket and light clothing. The graph shows, for example, that predicted survival time is about 2½-3 hours in water of 10°C (50°F). Predicted survival time is increased by extra body fat and decreased by small body size. Although women generally possess slightly more fat than men they cool slightly faster due to their usually small body size. However, for comparable sizes, the man will cool faster.

"COLD WATER SURVIVAL"
CANADIAN RED CROSS

ANNEX VI **APPENDICE VI**



Side scan echo sounder trace.
Graphique du sondeur à balayage latéral.

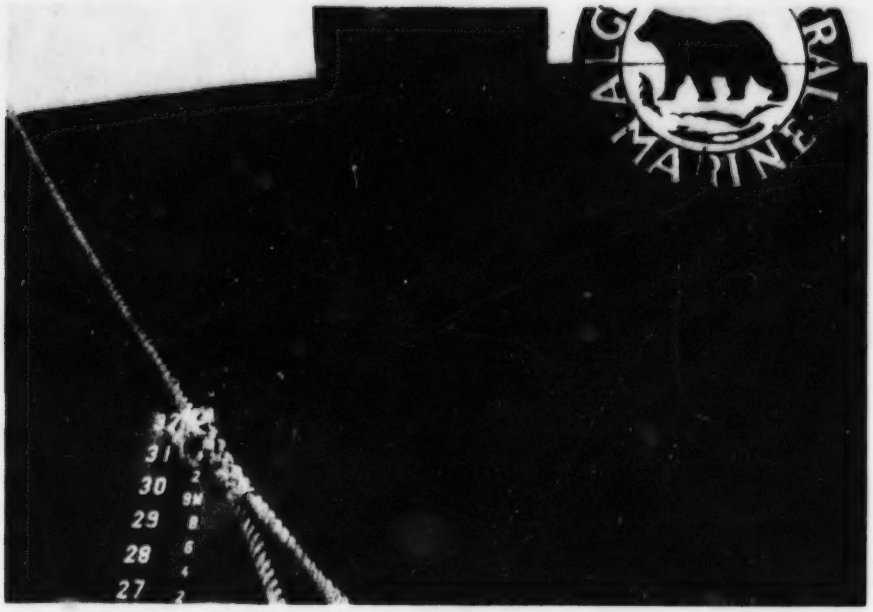
Interpretation by Marine Casualty Investigations.
Interprétation faite par les Enquêtes sur les accidents maritimes.

The "COUDRES DE L'ÎLE" leaving Sept-Îles at 14:30 on June 14, 1988.

Le navire "COUDRES DE L'ÎLE" au départ de Sept-Îles le 14 juin 1988 à 14:30.

Arrival of the "ALGOWEST" at the port of Baie-Comeau (Cargill) at 18:30 on June 15, 1988.

Arrivée du navire "ALGOWEST" dans le port de Baie-Comeau (Cargill) le 15 juin 1988 à 18:30.



Outline of the starboard bow of the "COUDRES DE L'ÎLE" imprinted on the port bow of the "ALGOWEST".

Profil de l'étrave côté tribord du "COUDRES DE L'ÎLE" imprimé sur l'avant côté bâbord de l'"ALGOWEST".

Damage to the "ALGOWEST", port side, below the hawse-pipe.

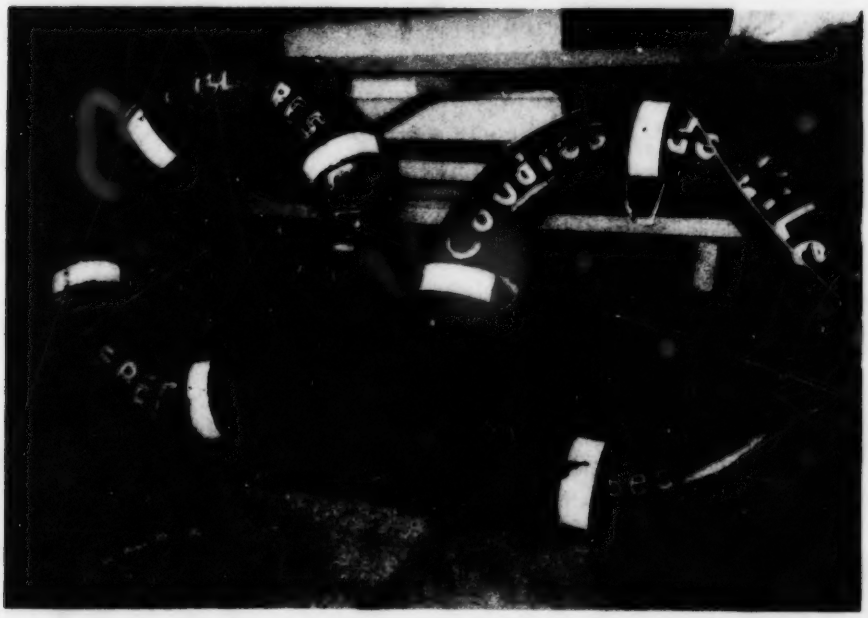
Avaries au navire "ALGOWEST", côté bâbord, sous le manchon d'écubier.

Outline of the starboard bow of the "COUDRES DE L'ÎLE" imprinted on the port bow of the "ALGOWEST".

Profil de l'étrave côté tribord du "COUDRES DE L'ÎLE" imprimé sur l'avant côté bâbord de l'"ALGOWEST".

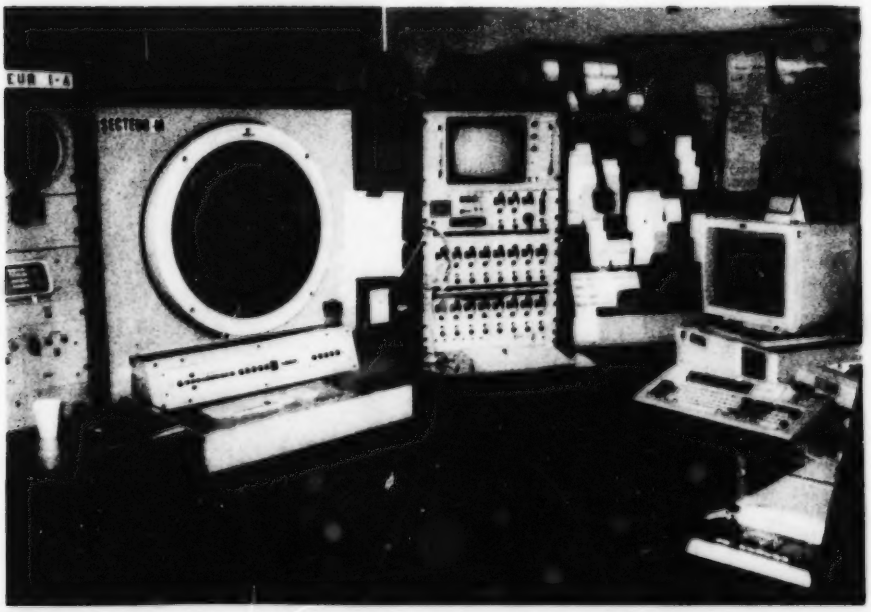
Defective buoy, filled with water when recovered by the CCG.

Bouée défectueuse remplie d'eau lorsque repêchée par la GCC.



Lifebuoys belonging to the "COUDRES DE L'ÎLE" recovered.

Bouées de sauvetage repêchées appartenant au "COUDRES DE L'ÎLE".



Les Escoumins VTS Centre sector 1A consol.

Station du secteur 1A du Centre des STM de Les Escoumins.